

STUDIES IN THE THEACEAE, XXVII
MISCELLANEOUS NEW SPECIES IN THEACEAE

CLARENCE E. KOBUSKI

STUDY AND WORK on a single genus is never truly completed. The publication of such a work often incites an interest for even further study, as the author begins receiving unexpected material for identification — material which often changes his opinion of his own work supposedly completed. Such is the case in the genus *Adinandra*. Shortly after the publication of a review of the genus more than seven hundred additional specimens were received, mostly from Indonesia. These were sent primarily for my studies to be included in the *Flora Malesiana*. Several new species have been discovered among these specimens, and these are being included here, since considerable time will elapse before their descriptions will appear in the *Flora*. Also included are a few new entities in *Eurya* and *Freziera*. All are oriental except a single species of *Freziera* from Colombia.

***Adinandra anisobasis*, sp. nov.**

Arbor magna, 20–30 m. alta; trunco 30–60 cm. diametro; ramulis juvenilibus rubris, teretibus, adpresso-pubescentibus; ramulis maturis glabris, teretibus, brunneo-rubris; gemmis terminalibus conicis, dense aureo-adpresso-pubescentibus. Folia coriacea, late ovata vel elliptica, 8–14 cm. longa, 5–7 cm. lata, supra nitida, glabra, subtus pallidiora, pubescentia, punctata, apice obtusa, late acuminata vel rotundata, basi inaequalia, subrotundata, rare obtusa, margine integra, venis 10–12 paribus, undique elevatis, marginem intra anastomosantibus arcuantibusque, petiolis brevibus, ca. 2 mm. longis vel subsessilibus. Flores axillares, solitarii; pedicellis teretibus, ca. 1.5 cm. longis, brevi-adpresso-pubescentibus; bracteolis 2, persistentibus, oppositis vel suboppositis, late ovatis vel deltoideis, subaequalibus, ca. 2.5 cm. longis latisque, adpresso-pubescentibus; sepalis 5, imbricatis, late ovatis vel subrotundatis, duobus exterioribus ca. 5 mm. longis et 4 mm. latis, margine integris, dorso ad marginem dense adpresso-pubescentibus, tribus interioribus ca. 7 mm. longis et 5 mm. latis, margine scariosis, integris, dorso medio adpresso-pubescentibus; petalis 5, cremeo-albis basi connatis, obovatis, ca. 15 mm. longis, 5.5–7 mm. latis, integris, apice rotundatis, exteriore medio adpresso-pubescentibus; staminibus ca. 35, 3-vel 4-seriatis, filamentis ad basim corollae adnatis, 5–7 mm. longis, supra pubescentibus, ad basim glabris, antheris ca. 5 (–6) mm. longis, dense brunneo-pubescentibus; ovario globoso, glabro, ca. 4 mm. diametro, 5-loculari, mutiovulato, apice abrupte in stylum attenuato, stylo integro, glabro, ca. 10 mm. longo, stigmatibus punctiformi. Fructus maturus non visus.

BRITISH NORTH BORNEO: Mt. Kinabalu: Penataran river basin, Penataran river, in jungle near Lobang, alt. 3500 ft., *J. & M. S. Clemens 34154* (Bogor, TYPE; AA, fragment), July 25, 1933 (tree 70 ft.; diam. 1–2 ft.; flowers cream, the anthers brown). — Penataran river basin, Wusser River, alt. 3500 ft., *J. & M. S. Clemens 34035* (Bogor), July 22, 1933 (tree 80 ft. high., diam. 2 ft.; flowers cream-white, the anthers brown).

The outstanding characteristic of this species is the unequal base of the shining subsessile leaves. In this character it resembles *A. cordata*, also found on Mt. Kinabalu. However, the latter species can be separated by (1) the truly cordate leaf-base; (2) larger (20 × 10 mm.) glabrous corolla-lobes; and (3) larger calyx-lobes (12 × 18 mm.), broader than long.

Cited here may be a third specimen, unnumbered, collected by J. & M. S. Clemens at Penibukan, 4000 ft. altitude, on Mt. Kinabalu. This specimen is sterile but agrees with the species in foliage and branch characters.

***Adinandra endertii*, sp. nov.**

Arbor; ramis rubro-griseis, teretibus glabris (innovationibus leviter pubescentibus), gemmis terminalibus longo-conicis pubescentibus. Folia membranacea vel chartacea, elliptica, glabra, subtus punctata, 4–5 cm. longa, 1.3–1.7 (–2) cm. lata, apice acuta, basi cuneata decurrentiaque, margine integra vel subintegra, venis 7–9 paribus, petiolis circiter 3 mm. longis, subtus pubescentibus. Flores axillares, solitarii; pedicellis teretibus, tenuibus, circiter 2 cm. longis, glabris (basi saepe leviter adpresso-pubescentibus); bracteolis 2, oppositis, late ovatis vel subrotundatis, inaequalibus, 1.5–2.5 mm. longis, 2.5–3.5 mm. latis, persistentibus, in medio crassioribus, ut videtur glabris (sub magnificatione leviter adpresso-pubescentibus); sepalis 5, imbricatis, glabris (sub magnificatione leviter adpresso-pubescentibus), late ovatis, apice rotundatis, subaequalibus, ca. 7 mm. longis, 5–8 mm. latis; petalis 5, ovatis, ca. 6 mm. longis (in gemmis), dorso medio dense pubescentibus; staminibus numerosis, 3-seriatis?, filamentis glabris, ad basim corollae adnatis, antheris dense hirsutis; ovario subplano, glabro, 5-angulato, apice in stylum abrupte attenuato, 5-loculari, multiovulato. Fructus non visus.

EAST BORNEO: W. Koetai: near Kemoel, forest in very mountainous country, alt. 1600 m., *F. H. Ender 4135* (Arnold Arboretum, TYPE; Bogor, ISOTYPE), Oct. 14, 1925 (tree with greyish green buds).

In general characters this species resembles the Philippine species more closely than the Indonesian species. The smaller chartaceous elliptic leaves and the smaller, less robust flowers and floral parts remind one of *A. apoensis* Elmer of Mindanao. The Philippine species, however, can be separated by the coriaceous leaves, broadly rounded at the apex, with the margin serrate along the upper half. The filaments in *A. apoensis* are very hirsute — as hirsute as the anthers.

Adinandra laronensis, sp. nov.

Arbor ?; ramulis maturis teretibus, griseis, glabris; ramulis juvenilibus teretibus, rubris, adpresso-pubescentibus; gemmis terminalibus conicis, dense aureo-adpresso-pubescentibus. Folia coriacea, elliptica vel subelliptica, 7–13 cm. longa, 2.5–4 cm. lata, supra glabra, subtus glabrescentia, apice late acuta vel obtusa, basi cuneata, margine integra vel minute glanduloso-denticulata, venis ca. 12 paribus, marginem intra anastomosantibus arcuantibusque, petiolis brevibus, 2–3 mm. longis, glabris. Flores ignoti. Fructus immaturi axillares, solitarii; pedicellis teretibus, 1.5–2 cm. longis, glabris; bracteolis 2, oppositis, persistentibus, glabris, rotundatis vel subrotundatis, ca. 3 mm. longis latisque; sepalis 5, imbricatis, glabrescentibus (juvenilibus adpresso-pubescentibus), rotundatis, 5–7 mm. longis latisque; petalis non visis; fructibus immaturis globosis vel subglobosis, glabris, 5-ocularibus, multiseeminatis; seminibus nigris, nitidis, 2 mm. longis, reticulatis.

CELEBES: Gouvt. Celebes en Onderh.: Malili, near Larona, "Mantri Boschwezen" bb.2399 (Bogor, TYPE), Oct. 13, 1922. — Same locality, "Mantri Boschwezen" 1875 (Bogor).

This species owes its proposed status to its very distinct leaves. Ordinarily one would not suggest a new species on such sparse material, since only a single attached immature fruit is to be found. However, the rather thick coriaceous elliptic leaves make it stand out from the other species on the island. A third specimen (bb.3225) collected at the same locality and by the same collector, "Mantri Boschwezen," obviously an unknown assistant, might be cited here. The leaves in this third specimen are wider.

Adinandra loerzingiana, sp. nov.

Arbor 25 m. alta; ramis griseis, teretibus, glabris, cicatricibus magnis, ca. 4 × 3 mm., ramulis novellis rubris, leviter adpresso-pubescentibus; gemmis terminalibus longis, adpresso-fulvo-pubescentibus. Folia sessilia, crasso-coriacea, glabra, elliptica vel subelliptica, 10–15 cm. longa, 5–7 cm. lata, apice obtusa, subtiliter late acuminata, basi late cuneata, margine integra, venis prominentibus, primariis 20 (vel plus) paribus, marginem intra anastomosantibus, venis secundariis inter primarias frequentibus. Flores axillares, solitarii; pedicellis glabris, curvatis, teretibus, 2–2.5 cm. longis; bracteolis 2, suppositis, persistentibus, glabris, deltoideis, inaequalibus, ca. 2 mm. longis latisque; sepalis 5, imbricatis, glabris, subrotundatis, inaequalibus, exterioribus duobus minoribus, ca. 5 mm. longis et 7 mm. latis, interioribus tribus ca. 5 mm. longis et 12–13 mm. latis, margine late scariosis; petalis 5, basi connatis, glabris, cremeis, obovatis, inaequalibus, exterioribus ca. 15 mm. longis et 9 mm. latis, interioribus ca. 15 mm. longis et 12–13 mm. latis; staminibus ca. 40, ut videtur 4-seriatis, inaequalibus, 10, 11, 12 et 13 mm. longis, filamentis 4–5 mm. longis basi connatis, glabris vel apice leviter pubescentibus, antheris inaequalibus, 6, 7, 8, et 9 mm. longis, dense setiferis; ovario late conico, ca. 3 mm. longo,

5 mm. diam., ad apicem adpresso-pubescente, 2-loculari, pauci-ovulato, stylo glabro, integro, ca. 1.5 cm. longo. Fructus globosus vel subglobosus, glabrescens vel apice leviter adpresso-pubescentis, 1.5–2 cm. diam., 2-locularis, pauci-seminatus, seminibus 2–10 (rare uno semine in quoque loculo), subplanis, hippocrepiformibus, 7–8 mm. longis, nitidis.

SUMATRA: Gouvt. Oostkust Sumatra: Afd. Sibolangit, near Bandar baroe, rare in primary forest, alt. 850 m., *J. A. Lörzing 6862* (Bogor, TYPE), Sept. 7, 1919 (tree 15 m. with hard wood; flowers fragrant, cream-colored); same general locality, *J. A. Lörzing 7040* (Bogor), Jan. 7, 1920 (tree 25 m. high).

This species is characterized by the sessile, thickly coriaceous, many-veined leaves, the persistent bracteoles, the two-celled ovary and fruit, and the few ovules and seeds. In some dissections a single seed was found in each locule of the fruit. The leaf-scars are unusually large, measuring as much as 5 mm. in diameter. This large scar is due to the unusually thickened base of the sessile leaves.

The only other two species known to have two-celled ovary and fruit are *A. nunkokensis* Kob. from Mt. Kinabalu, British North Borneo and *A. subsessilis* Airy-Shaw of Sarawak. In both *A. nunkokensis* and *A. subsessilis* the flowers are briefly pedicellate, longer (5 mm.) in the former species and subsessile in the latter. In both species the leaves are long-acuminate and the veins are fewer in number (6–8 pairs in *A. nunkokensis* and 12–14 pairs in *A. subsessilis*).

Adinandra kjellbergii, sp. nov.

Arbor (immatura) 6 m. alta; ramulis multis, teretibus, glabris, innovationibus leve adpresso-pubescentibus, gemmis terminalibus parvis, conicis, dense adpresso-pubescentibus. Folia coriacea, obovata, 5–9 cm. longa, 2–4 cm. lata, apice obtusa vel rotundata, late acuminata, basi cuneata, supra nitida glabra, subtus pallidiora, sparse adpresso-pubescentia, margine integra vel glanduloso-denticulata, venis undique obscuris, ca. 8 paribus, petiolis 7–10 mm. longis. Flores axillares, solitarii; pedicellis tenuibus, 1.5–2 cm. longis, sparse adpresso-pubescentibus vel glabrescentibus; bracteolis 2, oppositis, adpresso-pubescentibus, inaequalibus, una late rotundata, 2.5 mm. longa et 4 mm. lata et altera late ovata, 2.5 mm. longa et 3 mm. lata, apiculata; sepalis 5, imbricatis, rotundatis, 7–9 mm. longis, ca. 8 mm. latis, dense adpresso-pubescentibus; petalis 5, albis, basi connatis, obovatis, ca. 12 mm. longis, 6–8 mm. latis, exteriore medio aureo-adpresso-pubescentibus; staminibus ca. 40, bi-seriatis ut videtur, ca. 7 mm. longis, filamentis ad basim corollae adnatis, connatis, ca. 3 mm. longis, dense pubescentibus, antheris ca. 4 mm. longis, dense pubescentibus; ovario globoso, glabro, ca. 3 mm. diametro, apice subtruncato, 5-loculari, multiseminato. Fructus non visi.

CELEBES: Gouvt. Celebes en Onderh.: Makale, Rantepao, near Doa, alt. 1000 m., *J. van Zijl de Jong 29/vz* (Bogor bb.20268), Feb. 9, 1936 (young tree 6 m. high with white flowers). — Todjamboe, rare in rain forest, alt. 800 m.,

G. Kjellberg 2281 (Mus. Bot. Stockholm, TYPE; Bogor, ISOTYPE), Aug. 12, 1929 (tree ca. 15 m.).

In this species all the floral parts with the exception of the style and ovary are densely appressed-pubescent. In the stamens both the anthers and the filaments (except the portion touching the corolla) are densely pubescent. The ovary is unusual in that the apex is quite truncate rather than tapering, so that the style rises abruptly rather than gradually as is usually the case.

As the flowering material of the type was very sparse, only a single floral dissection was possible. However, the abundant pubescence on the floral parts is distinctive for any *Adinandra* in the region.

Adinandra masambensis, sp. nov.

Arbor nondum adulta 25 m. alta; ramulis teretibus, robustis, rigidis, rubro-brunneis, partibus juvenilibus pubescentibus. Folia crasso-coriacea, elliptica vel ovato-elliptica, 7–12 cm. longa et 4–6.5 cm. lata, apice obtusa vel rotundata, submarginata, basi rotundata vel subcordata, supra glabra subtus juventute pubescentia, glabrescentia, costa supra canaliculata, subtus elevata, margine integra, venis undique obscuris, petiolis crassis, teretibus, ca. 5 mm. longis. Flores non visi. Fructus (juvenes) axillares, solitarii; pedicellis ca. 2.5 cm. longis, apice 3 mm. crassis; bracteolis 2, oppositis, persistentibus, adpresso-pubescentibus, latissimis, sublunatis, basi crassis, inaequalibus, 5 mm. longis \times 9 mm. latis et 4 mm. longis \times 7 mm. latis, adpresso-pubescentibus, margine subciliatis; sepalis 5, imbricatis, crassis, subrotundatis, adpresso-pubescentibus subaequalibus, 9–10 mm. longis et 11–12 mm. latis; ovario globoso, ca. 5 mm. diametro, glabro, 5-loculari, multiovulato; stylo fracto.

CELEBES: Gouvt. Celebes en Onderh.: Masamba, near Rato, rare, alt. ca. 1000 m., *F. Grot 6* (Bogor, *bb. 26298*, TYPE), Sept. 11, 1938 (young tree 25 m., diameter 30 cm.; flowers white).

Outstanding characteristics of this new species are (1) the thick coriaceous pubescent leaves, almost elliptic in shape, subretuse at the apex, rounded or subcordate at the base, *not* decurrent into the petiole, with obscure veining; (2) the persistent bracteoles, much broader (9 mm.) than long (5 mm).

Its closest relative appears to be *A. cordata* from British North Borneo. This latter species can be separated by its glabrous leaves, sharply oblique-cordate at the base, obtusely acuminate at the apex, with ten to twelve conspicuous pairs of veins, and its sericeous ovary.

Neither flowers nor mature fruit were available for this study. However, the glabrous, five-celled fruit, although immature, and the unusual leaves show the species to be distinct from its nearest relatives and so worthy of description.

Adinandra rantepaoensis, sp. nov.

Arbor ca. 15 m. alta; ramulis paucis, teretibus, glabris; gemmis terminalibus glabris. Folia crasso-coriacea, elliptica vel ovato-elliptica, 13–19 cm. longa, 5.5–8 cm. lata, apice late ovata vel obtusa, subacuminata, basi cuneata in petiolum decurrentia, margine integra, venis 8–10 paribus, undique conspicuis, adscendentibus, ad marginem anastomosantibus, petiolis ca. 1.5 cm. longis, glabris. Flores solitarii, axillares; pedicellis glabris, teretibus, 2.5–3.5 cm. longis, 2.5–3 mm. crassis, apice curvatis; bracteolis 2, oppositis, crassis, glabris, subaequalibus, latioribus quam longis, semirotundatis, 4–5 mm. longis, 7–9 mm. latis, integris; sepalis 5, imbricatis, glabris, crassis, subrotundatis, exterioribus duobus 12 mm. longis et 14 mm. latis, interioribus tribus 9 mm. longis et 11 mm. latis; petalis (immaturis) 5, obovatis, ca. 15 mm. longis et 12 mm. latis, apice subacutis, dorso dense pubescentibus (margine excepto); staminibus ca. 60, ut videtur 3-seriatis, ca. 10 mm. longis, dense pubescentibus, filamentis connatis, ca. 7 mm. longis, basi ad corollam adnatis, antheris ca. 3 mm. longis; ovario globoso vel subgloboso, 6–7 mm. diametro, dense luteo-pubescente, 5-loculari, multiovulato, pericarpio crasso; stylo 7 mm. longo, glabris basi excepto; stigmatate punctato. Fructus non visi.

CELEBES: Gouvt. Celebes en Onderh.: Rantepao, Bala, Balambang, alt. 1600 m., *J. K. Thenu 19* (bb. 11857) (TYPE, Bogor), Sept. 6, 1927 (tree ca. 15 m.). — Same locality, *J. K. Thenu 8* (bb. 11846) (Bogor).

This distinctive species is characterized by large heavy-coriaceous glabrous leaves with eight to ten widely spaced primary veins. The leaf-base is cuneate and decurs into the petiole, nearly to its base. The floral parts are all large. A single stamen adhering to the lobe of the calyx shows that at maturity the longer stamens may measure up to ten mm. The corolla, which was described above from a bud, may be considerably extended at anthesis. The cell cavity of the ovary is rather small and appears to be confined to a small area near the base of the ovary. It measures only ca. 2 mm. in diameter. The pericarp is very thick, measuring about 2 mm. thick at the base. The upper two thirds of the ovary is dense and of the same texture as the pericarp, with no cell structure obvious.

Adinandra rubiginosa, sp. nov.

Arbor 25 m. alta, trunco angulatissimo, 40 cm. diametro; ramulis teretibus, rubro-brunneis, pubescentibus; gemmis terminalibus dense hirsutis. Folia coriacea, oblongo-ovata, 10–15 cm. longa, 3.5–4 cm. lata, supra glabra, rubiginosa, subtus dense rubro-brunnea hirsuta, apice acuta, basi cuneata, margine integra, venis obscuris, petiolis crassis, ca. 5 mm. longis et ca. 3 mm. diametro. Flores axillares, solitarii; pedicellis crassis, recurvatis, teretibus, 5 mm. longis, 3 mm. diametro; bracteolis 2, oppositis, persistentibus, crassis, semi-rotundatis, inaequalibus ca. 3 mm. longis \times 4 mm. latis et 2 mm. longis \times 4 mm. latis, dorso pubescentibus, margine ciliatis; sepalis 5, imbricatis, inaequalibus, duobus exterioribus rotundato-

ovatis, 5 mm. longis, basi 5 mm. latis, pubescentibus, tribus interioribus subrotundatis, glabris, ca. 7 mm. longis, 5 mm. latis, margine scariosis; petalis (immaturis) 5, dorso glabro; staminibus (immaturis) ca 30, 3-seriatis ?, filamentis basi connatis, ad basim corollae adnatis, subtus, glabris, super hirsutis, antheris elongatis, ca. 3 mm. longis, dense hirsutis, apice apiculatis; ovario semi-globoso, 5-loculari, multiovulato, apice abrupte in stylum attenuato, stylo glabro, integro, stigmatate punctiformi. Fructus (immaturus) globosus, glaber, 5-locularis, multiseminatus, stylo 13 mm. longo.

BORNEO: Subdiv. W. Koetai: near Kemoel, in forest on steep ravine wall, alt. 1100 m., *F. H. Endert 3869* (AA, TYPE; Bogor, ISOTYPE), Oct. 10, 1925 (tree 25 m. high, 25 cm. diam.; trunk very angular; flowers white).

This species is characterized by dark red, coriaceous, oblong-ovate leaves glabrous on the upper surface (even in the terminal bud) and densely hirsute on the lower surface, becoming glabrescent. The pubescence on the younger leaves is striking in that it appears to be densely distributed in distinct longitudinal striae. Although not an unusual occurrence in other pubescent species of the family, this character is unusual in *Adinandra*. Also characteristic is the short thick pedicel.

Although both flowers and fruit were available for this study, it is unfortunate that neither was mature. The petals and stamens were described from a bud, making accurate measurements quite impossible. However, the diagnostic characters were discernible, showing this species to be distinct.

Adinandra steenisii, sp. nov.

Arbor parva, ad 5 m. alta; ramulis multis, congestis, glabris, juventute adpresso-pubescentibus; gemmis terminalibus luteo-adpresso-pubescentibus. Folia coriacea, rotundata, parva, 1–2 cm. longa, 0.8–1.5 cm. lata, apice rotundata, subretusa, basi cuneata, supra glabra, subtus cito glabrescentia, margine integra vel rare crenulata, venis 5–7 paribus, supra obscuris, subtus conspicuis, adscendentibus ad marginem anastomosantibus, petiolis teretibus, glabris, 1–1.5 mm. longis. Flores non visi. Fructus axillares, solitarii; pedunculis teretibus, ca. 1 cm. longis, glabris; bracteolis 2, oppositis, subaequalibus, latioribus quam longis, semi-rotundatis, 1.7–1.8 mm. longis, ca. 3 mm. latis, glabris; sepalis 5, imbricatis, glabris, subaequalibus, rotundatis, 6–8 mm. longis, ca. 8 mm. latis. Fructus globosus, glaber, 8–10 mm. diametro, 5-locularis, multiseminatus, stylo glabro, ca. 10 mm. longo, stigmatate punctato.

CELEBES: Gouvt. Celebes en Onderh: Route Rante Lemo-Angin Angin via Poka Pindjang, alt. 2500 m., *C. G. G. J. van Steenis 10303* (TYPE, Bogor), June 19, 1937 (small tree \pm 5 m. high).

This species is very distinctive and can be easily recognized by its small habit (tree to 5 m. high), the very small rotund leaves (1–2 cm.

long), with the petiole measuring only 1–2 mm., and the small fruit. In general, all the parts seem to be in miniature.

The flowers were not seen, and the fruit as described above probably was immature. However, the species should be easily recognized in the future.

This species is named after C. G. G. J. van Steenis, the collector.

***Adinandra subauriculata*, sp. nov.**

Arbor ad 22 m.; ramis griseis, teretibus, crassis, glabris; gemmis terminalibus ignotis. Folia crasso-coriacea, ovata, glabra, 10–17 cm. longa, 5–6 cm. lata, apice obtusa, basi rotundata, subauriculata, margine minute glanduloso-denticulata, costa subtus conspicua, venis lateralibus ca. 20 primariis paribus, gracilibus ad marginem anastomosantibus, venis secundariis inter primarias frequentibus, petiolo brevi, crasso, ca. 5 mm. longo. Flores non visi. Fructus axillares, ut videtur solitarii; pedicellis glabris, teretibus, brevibus, 0.5–1.5 cm. longis, crassis, ca. 2–3 mm. diam.; bracteolis caducis; sepalis 5, imbricatis, persistentibus, ovatis vel late ovatis, ca. 1 cm. longis et 7 mm. latis, leviter adpresso-pubescentibus. Fructus globosi vel subglobosi, leve pubescentes vel glabrescentes, ca. 2 cm. diam., 3-loculares, multiseminati, seminibus subplanis hippocrepiformibus, nigris, nitidis, ca. 5 mm. longis, 3–4 mm. latis.

SUMATRA: Res. Sumatra's Westkust: Soeliki, in old forest, alt. 1300 m., *Neth. Ind. For. Serv. bb. 6538* (TYPE, Bogor; ISOTYPE, Arnold Arboretum), Feb. 16, 1924 (tree 22 m. high, 8 m. to first branch, 40 cm. diam. breast high; fruit green, malodorous, bitter).

The outstanding characters of this species are (1) the thick-coriaceous leaf with a rounded subauriculate base and a short thick petiole; (2) a pubescent three-celled fruit with many (up to eighty) flattened hippocrepiform shiny seeds. The latter character is unusual in the genus in that most species with three-celled fruits are known to possess very few (not more than twenty) large seeds, usually thicker than those found in this species. Several fruits were carefully dissected and all showed at least sixty well-developed seeds.

The closest relative appears to be *A. cordifolia* Ridley, found in Sarawak and British North Borneo. In this species the fruit is five-celled, the leaves are distinctly cordate (unequally so) at the base, subsessile or with a very brief petiole.

***Adinandra subunguiculata*, sp. nov.**

Arbor ad 15 m. alta; ramulis maturis innovationibusque glabris, teretibus; gemmis terminalibus conicis, aureo-adpresso-pubescentibus. Folia coriacea, glabra, obovata vel subelliptica, 9–12 cm. longa, 4–6 cm. lata, apice late acuminata vel obtusa, basi cuneata, margine integra vel minute denticulata, venis 12 paribus vel plus, obscuris, petiolis 4–5 mm. longis. Flores axillares, solitarii; pedicellis glabris, 3.5–4.5 cm. longis, ad apicem

accrescentibus; bracteolis 2, alternatis vel suboppositis, inaequalibus, bracteola superiore rotundata, ca. 2 mm. longa et 3 mm. lata, glabra, bracteola inferiore deltoidea, ca. 1.5 mm. longa et basi 1.5 mm. lata, glabra; sepalis 5, imbricatis, subrotundatis, subaequalibus, 5–6 mm longis, 6–8 mm. latis, glabris, interioribus rare exceptis, dorso medio minutissime adpresso-puberulentis, cito glabrescentibus; petalis 5, glabris, inaequalibus, exterioribus obovatis, 14 mm. longis, 11 mm. latis, interioribus sub-unguiculatis, 11 mm. longis, 8 mm. latis; staminibus 40–45, 4-seriatis ut videtur, 4–7 mm. longis, filamentis connatis, glabris, ad basim corollae adnatis, 2–3.5 mm. longis, antheris setosis, 2–3.5 mm. longis; ovario conico vel subgloboso, glabro, 5-loculari, multiovulato, stylo glabro, ca. 1 cm. longo. Fructus globosus, glaber, ca. 1 cm. diametro, 5-locularis, multi-seminatus; seminibus nigris, nitidis, reticulatis.

CELEBES: Gouvt. Celebes en Onderh.: MALILI: near Tabaramo, alt. 600 m., *A. Hoornstra* 32 (Bogor *bb.9710*), Apr. 9, 1926 (tree 17 m., with white flowers). KENDARI: N. Kendari, rain-forest, alt. 150–300 m., *G. K. Kjellberg* 641 (Bogor, TYPE), March 3, 1929. — Poehara, rain-forest, alt. 100 m., *G. K. Kjellberg* 698 (Bogor), March 6, 1929. — Peninsula, southeast of Lepo-Lepo, *O. Beccari* 1190, 1190A, 1190B (Firenze), July 1874. — “BOETON EIL MOENA”: Laboenti, alt. 15m., *C. P. Burghaut* 85 (Bogor *bb.5860*), July 28, 1923 (tree 14 m. with white flowers). MOENA: Labouti, *A. G. Waturandang* 250 (Bogor, *bb.21788*), January 22, 1937 (tree 15 m. with white flowers).

This species is one which cannot be placed in close association with any other species of the genus, yet has no truly outstanding characteristics of its own to separate it from all others! The bracteoles are usually sub-alternate. All the floral parts except the setose anthers are glabrous, the terminal bud is tawny appressed-pubescent, yet the early leaves and the young branchlets are glabrous or quickly become so. The ovary is five-celled with very many characteristic small ovules.

From the label of Bogor 5860 I cannot be certain of the place of collection — whether from Moena or the near-by island of Boeton. However, I am inclined to feel that it was collected on Moena, considering the almost duplicate label of *Bogor 21788*.

Adinandra dubia, sp. nov.

Frutex; ramulis juvenilibus teretibus, sericeis; ramulis maturis glabris vel glabrescentibus, griseis, teretibus; gemmis terminalibus conicis, dense aureo-sericeis. Folia coriacea, ovata vel elliptico-ovata, 6–11 cm. longa, 2–3.5 cm. lata, supra nitida, glabra, subtus pallidiora, pubescentia, apice acuminata, basi cuneata, margine denticulata (juventute glanduloso-denticulata), venis ca. 10 paribus, undique leve elevatis, marginem intra anastomosantibus arcuantibusque, petiolis 7–10 mm. longis, subtus pubescentibus. Flores axillares, solitarii; pedicellis teretibus, 5–8 mm. longis, recurvatis, sericeis; bracteolis 2, suboppositis, longo-triangularibus, 6–6.5 mm. longis, basi 3–4 mm. latis, adpresso-sericeis, margine glanduloso-denticulatis, cito caducis; sepalis 5, imbricatis, inaequalibus, dense sericeis, late ovatis, ex-

terioribus 6–7 mm. longis, 5–6 mm. latis, interioribus 4–5 mm. longis, 2.5–4 mm. latis; petalis 5, dorso medio adpresso-sericeis, oblongo-ovatis, 3–5 mm. longis, ca. 2 mm. latis; staminibus ut videtur 1-seriatis, paucis (ca. 20) ad 2.25 mm. longis, filamentis 0.5 mm. longis, connatis, ad basim corollae adnatis, glabris, antheris 0.5–1.5 mm. longis, apice retusis, interiore dense hirsutis; ovario minuto, 1.5 mm. diametro, 5-loculato, multiovulato, glabro vel minute pubescente, stylo ca. 2.5–3 mm. longo, glabro vel minute adpresso-pubescente. Fructus ignotus.

SUMATRA: Res. Sumatra's Westkust: Ophir District, northwest slope of Talamau, alt. 2100 m., *H. A. B. Bünnemeijer 910* (Bogor, TYPE), May 28, 1917 (shrub).

Adinandra dubia, as the specific name intimates, is a provocative species. Every so often a worker is confronted with a specimen which seems to conform to a certain genus in all respects, yet instinctively a doubt persists as to its real position. Such is the case with *A. dubia*. The flowers are very small, with the corolla measuring only three to five millimeters long and two millimeters wide. The bracteoles are nearly petaloid and are actually larger (ca. 6 mm. long) than the petals, a most unusual feature in this genus. Minute are the stamens, the longest ones measuring only 2.5 mm. in length. They are also very few in number yet so closely joined together in the specimens dissected that an accurate count could not be obtained. The copious pubescence usually found on the anthers in most species of the genus is sometimes so sparse and scattered in *A. dubia* as to be almost negligible.

Closely allied and perhaps belonging here is a specimen collected by *Mareman* [Forest Res. Inst. 6216] at the Hoogvlakte area near Lake Toba in the Tapanoeli Res. Collected at a lower altitude [900 m.], the habit is that of a tree 21 meters high, which in itself is not unusual. However, the immature fruit is quite conical in shape and densely sericeous. So also is the style. This very noticeable difference in pubescence, especially since the Mareman specimen was collected in fruit, cannot be overlooked. A reversed situation would be quite understandable.

Eurya perserrata, sp. nov.

Frutex 3 m. (fide collectori) altus, ramulis teretibus, innovationibus rufo-pilosis. Folia subcoriacea, oblongo-elliptica vel oblongo-ovata, 14–18 cm. longa et 4.0–6.5 cm. lata, apice acuminata, basi late cuneata, subtus pilosa, venis utrinque conspicuis, margine acre glanduloso-serrata, serrationibus inaequalibus ad 2 mm. longis, sessilia vel subsessilia. Flores ♂ 2–3 in axillis foliorum, albi; pedicellis 1.5–2 mm. longis; bracteolis minutis, sepaloideis, ca. 1 mm. longis; sepala 5, imbricata, inaequalia, subrotundata, concava, 3–3.5 mm. longa et 2–2.5 mm. lata, extus intusque strigosa, margine scariosa, ciliata; petala 5, imbricata, inaequalia, oblongo-obovata, 5–6 mm. longa et 2.5–3 mm. lata, obtusa; stamina ca. 15, filamentis ca. 2.5 mm. longis, antheris ca. 1 mm. longis. Flores ♀ et fructus ignoti.

CHINA: Yunnan: Muchielung, Salwin-Kiukiang Divide, in dense mixed forest, alt. 2500 m., *T. T. Yü* 21035 (Arnold Arboretum, TYPE), Nov. 21, 1938, shrub 3 m. with white flowers.

Unfortunately, neither pistillate flowers nor fruit are available for study in this species. However, the serration on the leaves in the staminate plants is so outstanding that when the pistillate specimens are found they will be easily recognized. The serrations are approximately 2 mm. long (or more), surely the most conspicuous feature on the specimen. No other species in the genus approaches *E. perserrata* in this character. The rufous pilose terminal buds, the sessile or near-sessile leaves, and the large flowers are other outstanding characters.

***Eurya pseudocerasifera*, sp. nov.**

Arbor magna (30 m., fide Tsai), ramulis teretibus, innovationibus pubescentibus. Folia oblongo-elliptica, coriacea, decurrentia, 9–13 cm. longa et 3–5 cm. lata, apice acuminata, basi cuneata, supra nitida, subtus opaca, margine integerrima, glabra, basi costae excepta, venis elevatis subtus conspicuis, petiolis ca. 5 mm. longis, pubescentibus. Flores ♀ axillares, 3-fasciculati, albi; pedicellis ca. 3 mm. longis, pubescentibus; bracteolis minutis, sepaloideis, pubescentibus; sepalis 5, imbricatis, inaequalibus, concavis, subrotundatis, ca. 2 mm. longis et 2 mm. latis, pubescentibus, marginibus scariosis ciliatisque; petalis 5, imbricatis, inaequalibus, ca. 3 mm. longis et 2 mm. latis, obtusis, apice rotundatis vel submarginatis; ovario globoso, piloso, ca. 2 mm. diametro, 3-loculari, multiovulato, stylo 3- vel 4-partito, ca. 5 mm. longo, glabro, 1/2 libero; flores ♂ ignoti. Fructus (*T. T. Yü* 17251) baccatus, globosus, 4–5 mm. diametro, glabrescens, multiseminatus; semina minuta, nigro-nitida, reticulata, ca. 1 mm. diametro.

CHINA: Yunnan: Lung-ling Hsien, in woods, alt. 2300 m., *H. T. Tsai* 55002 (Arnold Arboretum), Jan. 7, 1934 (tree 20 ft. high with white flowers). — Mong-ka, in forest, alt. 1750 m., *H. T. Tsai* 56882 (Arnold Arboretum, TYPE), Feb. 9, 1934 (large tree 100 ft. high with yellow fruit). — Chenkang, Snow Range, Tapingchang, common in ravine among forest trees, alt. 2350 m., *T. T. Yü* 17251 (Arnold Arboretum), Aug. 6, 1938 (tree 20–25 ft. high). — Taron-Taru Divide, Tangtehwan, in mixed forest, alt. 1800 m., *T. T. Yü* 19974 (Arnold Arboretum), Aug. 27, 1938 (tree 30 ft. high).

This species is characterized by the entire leaves, the pubescent ovary, and the long style (five millimeters), three- or four-parted, the branches free for one half the length. Also most unusual is the size, recorded by Tsai (56882) as a big tree attaining a height of a hundred feet. None of the three other specimens examined and cited above is recorded as taller than thirty feet.

This species resembles *E. cerasifolia* (D. Don) Kob. superficially in the entire shining leaves and the conspicuous veining. However, in *E. cerasifolia* the leaves are not truly entire. Serration may be found on the upper half of the leaf, and then often confined to a single side. Also in *E. cerasi-*

folia, the ovary is glabrous, the style is shorter (two millimeters) and joined nearly its whole length.

Another species in close relationship is *E. pittosporifolia* Hu. The original author recorded this species as a tree six meters high with glabrous branchlets, oblanceolate leaves, long-acuminate at the apex and narrow-cuneate at the base, entire or crenulate on the upper two thirds. The sepals were reported as glabrous and the fruit densely ferruginous-sericeous. The styles were listed as five and distinct. In examining the isotype of *E. pittosporifolia* (C. W. Wang 78362), one finds also that the terminal buds are distinctly pilose and the sepals strigose.

***Freziera cuatrecasasii*, sp. nov.**

Arbor magna, ramis teretibus, undulatis, crassis, pubescentibus, lenticellatis, lenticellis numerosis, prominentibus, elevatis, subsuberosis, ramulis hornotinis dense fulvo-pilosulis. Folia coriacea, ovata, 18–23 (–33) cm. longa, 7–10 (–14.5) cm. lata, apice abrupte acuminata, basi subrotundata, conspicue inaequalia, margine integra, costa supra canaliculata, subtus basi ad 5 mm. elevata, supra glabra (juventate fulvo-pubescentibus, cito glabrescens), subtus pubescens, venis lateralibus 30–37 paribus undique prominentibus, reticulatis, petiolis ca. 1 cm. longis, pubescentibus, alatis. Flores axillares et cauliflori in axillis defoliatis pedicellati in fasciculum pedunculatum aggregati; pedicellis 3 mm. longis vel minus, curvatis, crassis, pubescentibus; bracteolis 2, oppositis, subrotundatis, ca. 3 mm. longis latisque, dense fulvo-pubescentibus; sepalis 5, imbricatis, adpresso-pubescentibus, rotundatis, ca. 4 mm. longis et 5 mm. latis, margine anguste scariosis, integris; petalis 5, albis, inaequalibus, 6–7 mm. longis, ca. 4.5 mm. latis, exterioribus duobus ovatis, non apiculatis, interioribus tribus apice acutis; staminibus (♀ fl.) ca. 15, uniseriatis, ca. 3 mm. longis, filamentis ca. 1 mm. longis, paucis claviformibus, antheris ca. 2 mm. longis; ovario glabro, conico, ca. 2 mm. diametro basi, apice attenuatis per stylum ca. 3 mm. in stigmatem, 5-loculari, multiovulato. Fructus ca. 7 mm. diametro, glaber, 5-locularis, multiseeminatus.

COLOMBIA: Dept. del Valle, Cordillera Occidental, Hoya del río Dígua, Río San Juan, 1300–1500 m. alt., abajo de Queremal a la derecha del río entre km. 52–53, *J. Cuatrecasas* 23985 (Arnold Arboretum, TYPE; Chicago Nat. Hist. Mus., ISOTYPE), Mar. 27, 1947 (gran árbol; hoja coriácea rígida, verde oscura brillante haz, verde pálida envés; sépalos verdes; pétalos blancos).

This species is most closely allied to *F. guatemalensis* in its pedunculate, fasciculate flowers, and to *F. Smithiana* in its large multiveined leaves and dense fulvous pubescence. It may be separated from the latter species by the pedunculate flowers, the shorter pedicels and petioles, the entire margin of the leaves, the presence in quantity of the conspicuous lenticels, and the somewhat undulate branches.

The outstanding features for this species are the huge coriaceous leaves measuring as much as 33 cm. long and 14.5 cm. wide, conspicuously veined, the pedunculate flowers (with the scales of former flowers below) both in

the axils of the leaves and on the stem in the defoliated axils. The large leaf-scars, along with the so-called cauline flowers, give to the older branches a somewhat undulate appearance which is missing in the younger branches and branchlets.

ARNOLD ARBORETUM,
HARVARD UNIVERSITY.